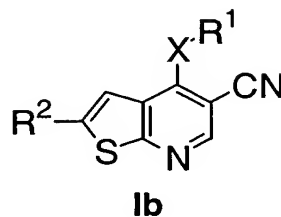
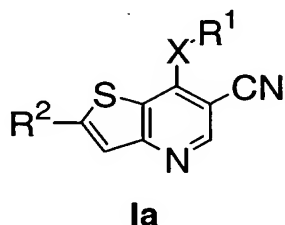


What is claim d is:

1. A compound of Formula (1a) and Formula (1b)



wherein:

- 5 X is -NH-, -NR⁴-, -O-, -S(O)_m-, -NHCH₂-;

m is an integer of 0-2;

n is an integer of 2-5;

q is an integer of 0-5;

- 10 R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -NO₂, -CN, -N₃, -CHO, -CF₃, -OCF₃, -R⁴, -OR⁴, -S(O)_mR⁴, -NR⁴R⁴, -NR⁴S(O)_mR⁴, -OR⁶OR⁴, -OR⁶NR⁴R⁴, -N(R⁴)R⁶OR⁴, -N(R⁴)R⁶NR⁴R⁴, -NR⁴C(O)R⁴, -C(O)R⁴, -C(O)OR⁴, -C(O)NR⁴R⁴, -OC(O)R⁴, -OC(O)OR⁴, -OC(O)NR⁴R⁴, NR⁴C(O)R⁴, -NR⁴C(O)OR⁴, -NR⁴C(O)NR⁴R⁴, -R⁵OR⁴, -R⁵NR⁴R⁴, -R⁵S(O)_mR⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵OC(O)R⁴, -R⁵OC(O)OR⁴, -R⁵OC(O)NR⁴R⁴, -R⁵NR⁴C(O)R⁴, -R⁵NR⁴C(O)OR⁴, -R⁵NR⁴C(O)NR⁴R⁴, or YR⁷;
- 15

R² is -H, -R³, -J, -C(O)XR³, -CHO, wherein the R³ group may be substituted by one or more groups selected from -C(O)XR⁸, -CHO, -C(O)Q, 1,3-dioxolane, -R⁸, -(C(R³)₂)_qXR⁸, -(C(R³)₂)_qQ, -X(C(R³)₂)_nXR⁸, -X(C(R³)₂)_nQ, or -X(C(R³)₂)_qR⁸;

- 20 R³ is alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

R⁴ is H, alkyl of 1-6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, a *trans*-alkenyl of 2-6 carbon atoms, or an alkynyl of 2-6 carbon atoms;

R⁵ is a divalent group comprising alkyl of 1-6 carbon atoms, alkenyl of 2-6 carbon atoms, and alkynyl of 2-6 carbon atoms;

R⁶ is a divalent alkyl group of 2-6 carbon atoms;

5 R⁷ is a cycloalkyl ring of 3-7 carbons, an aryl or heteroaryl ring, a aryl or heteroaryl fused to one to three aryl or heteroaryl rings, wherein any of the aryl, cycloalkyl, or heteroaryl rings may be optionally substituted with one to four substituents selected from the group consisting of -H, -aryl, -CH₂-aryl, -NH-aryl, -O-aryl, -S(O)_m-aryl, -J, -NO₂, -CN, -N₃, -CHO, -CF₃, -OCF₃, -R⁴, -OR⁴, -S(O)_mR⁴, -NR⁴R⁴, -NR⁴S(O)_mR⁴, -OR⁶OR⁴, -OR⁶NR⁴R⁴, -N(R⁴)R⁶OR⁴, -N(R⁴)R⁶NR⁴R⁴, -NR⁴C(O)R⁴, -C(O)R⁴, -
 10 C(O)OR⁴, -C(O)NR⁴R⁴, -OC(O)R⁴, -OC(O)OR⁴, -OC(O)NR⁴R⁴, -NR⁴C(O)R⁴, -NR⁴C(O)OR⁴, -NR⁴C(O)NR⁴R⁴, -R⁵OR⁴, R⁵NR⁴R⁴, -R⁵S(O)_mR⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵OC(O)R⁴, -R⁵OC(O)OR⁴, -R⁵OC(O)NR⁴R⁴, -R⁵NR⁴C(O)R⁴, -R⁵NR⁴C(O)OR⁴, or -R⁵NR⁴C(O)NR⁴R⁴;

15 R⁸ is -H, alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

R⁹ is -R⁴ or -F;

Y is -C(O)-, -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHSO₂-, -SO₂NH-, -C(OH)H-, -X(C(R⁹)₂)_qq⁻, -(C(R⁹)₂)_qq⁻, -(C(R⁹)₂)_qX-, -C≡C-, *cis*- and *trans*- -CH=CH- and cycloalkyl
 20 of 3-10 carbon atoms;

Q is NZZ' wherein Z and Z' may be the same or different and may be H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl;

25 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, optionally substituted with -R⁴ on a carbon or a nitrogen, or on nitrogen by a group -(C(R⁹)₂)_nXR³, -(C(R⁹)₂)_nNZ''Z''', or on carbon by a group -(C(R⁹)₂)_qXR³, -(C(R⁹)₂)_qNZ''Z'''

Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur;

5 Z'' and Z''' may be H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

J is fluoro, chloro, bromo, and iodo; or

a pharmaceutically acceptable salt thereof.

2. A compound of formula Ia or Ib according to claim 1 wherein X is NH.

10 3. A compound of formula Ia or Ib according to claim 1 wherein R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴ and YR⁷; and R⁷ is an aryl or heteroaryl ring, optionally substituted with one to four substituents selected from the group consisting of -H, -J, -CF₃, -OCF₃, -R⁴ and OR⁴.

15 4. A compound of formula Ia or Ib according to claim 1 wherein R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -Cl, -R⁴ and -OR⁴.

5. A compound of formula Ia or Ib according to claim 4 wherein R⁴ is alkyl of 1-6 carbon atoms.

20 6. A compound of formula Ia or Ib according to claim 1 wherein R² is substituted aryl or heteroaryl, wherein the substituent may be one or more groups selected from -(C(R⁹))_qQ.

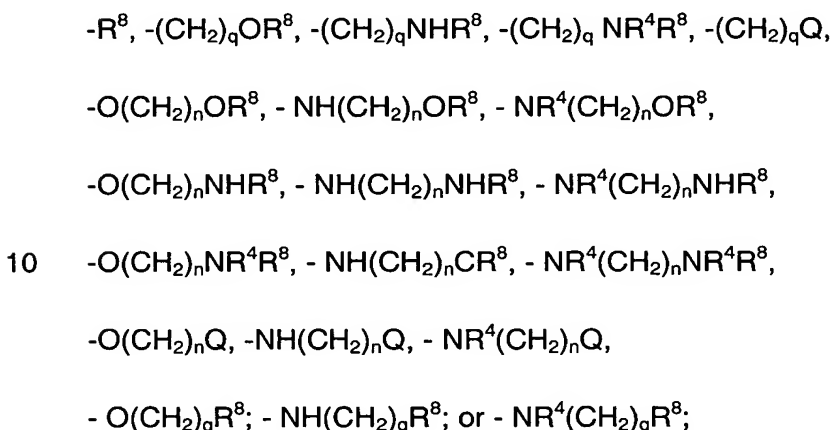
7. A compound of formula Ia or Ib according to claim 6 wherein q is 1 to 3.

8. A compound of formula Ia or Ib according to claim 6 wherein R⁹ is H.

25 9. A compound of formula Ia or Ib according to claim 6 wherein Q is NZZ' wherein Z and Z' may be the same or different and may be H, alkyl of 1 to 6 carbon atoms; or Z and Z' taken together with the nitrogen to which they are attached may

form a heterocyclic ring which may have an additional heteroatom selected from nitrogen and oxygen, said ring may be substituted on nitrogen or carbon by R^4 or on carbon by $(CH_2)_2OH$.

10. A compound of formula Ia or Ib according to claim 1 wherein R^2 is R^3
 5 where R^3 is alkynyl of 2-6 carbon atoms, aryl or heteroaryl; which groups may be substituted by one or more groups selected from



R^4 is H, alkyl of 1-6 carbon atoms;

- R^8 is -H, alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl
 15 of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

Y is $-C(O)-$, $-C(O)O-$, $-OC(O)-$, $-C(O)NH-$, $-NHC(O)-$, $-NHSO_2-$, $-S-$, $-O-$, $-NR^4-$;

Q is NZZ' wherein Z and Z' may be the same or different and are selected from H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

- 20 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with $-R^4$ on a carbon or a nitrogen, or on nitrogen by a group $-(CH_2)_nOR^3$, $-(CH_2)_nNHR^3$, $-(CH_2)_nNR^4R^3$, $-(CH_2)_nNZ''Z'''$, or on carbon by a group $-(CH_2)_qOR^3$, $-(CH_2)_qNHR^3$, $-(CH_2)_qNR^4R^3$, $-(CH_2)_qNZ''Z'''$,
 25

Z'' and Z''' may be the same or different and are selected from H, alkyl of 1 to 6 carbon atoms

Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from nitrogen,
5 oxygen and sulfur.

11. A compound of claim 1 comprising:

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-phenylthieno[3,2-b]pyridine-6-carbonitrile;
- 10 2-Bromo-7-[(2,4-dichloro-5-methoxyphenyl)amino]-thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-iodothieno[3,2-b]pyridine-6-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]thieno[2,3-b]pyridine-5-carbonitrile;
- 15 4-[(3-Chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl)amino]thieno[2,3-b]pyridine-5-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-iodothieno[2,3-b]pyridine-5-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-methylthieno[2,3-b]pyridine-5-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-methylthieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichlorophenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichlorophenoxy)]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichlorophenyl)thio]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichlorobenzyl) amino]thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(4-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-morpholinylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(4-{[4-(2-hydroxyethyl)piperazin-1-yl]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(piperidin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 4-{6-Cyano-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridine-2-yl]benzoic acid;
- 4-{6-Cyano-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridine-2-yl]benzamide;
- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[(4-methoxyphenyl)ethynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-2-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(dimethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-(1-Benzofuran-2-yl)-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(3-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(morpholin-4-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(4-formylphenyl)thieno[2,3-b]pyridine-5-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(morpholin-4-ylmethyl)phenyl]thieno[2,3-b]pyridine-5-carbonitrile;
- 5 4-[5-Cyano-4-(3,4,5-trimethoxy-phenylamino)-thieno[2,3-b]pyridin-2-yl]-butyric acid methyl ester;
- 2-(4-Hydroxybutyl)-4-[(3,4,5-trimethoxyphenyl)amino]-thieno[2,3-b]pyridine-5-carbonitrile;
- 10 2-[4-(4-Morpholinyl)butyl]-4-[(3,4,5-trimethoxyphenyl)amino]-thieno[2,3-b]pyridine-5-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[(trimethylsilyl)ethynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-ethynylthieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-4-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-3-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(1,3-dioxolan-2-yl)thien-3-yl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(5-formylthien-3-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(morpholin-4-ylmethyl)thien-3-yl]thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(4-hydroxypiperidin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(hydroxymethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 2-Iodo-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-(4-Formylphenyl)-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[4-(4-Methylpiperazin-1-ylmethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 10 2-[4-(Morpholin-4-ylmethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[4-(Hydroxymethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-Iodo-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-Bromo-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(4-Phenoxyphenyl)amino]-2-[(E)-2-pyridin-4-ylethenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- tert*-Butyl-(2E)-3-{6-cyano-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridin-2-yl}prop-2-enoate;
- 20 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(4-methylpiperazin-1-yl)prop-1-ynyl]thieno[2,3-b]pyridine-5-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-3-ylethynyl)thieno[2,3-b]pyridine-5-carbonitrile;
- (2E)-3-(6-Cyano-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridin-2-yl)prop-2-enoate;

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(2-formyl-1-methyl-1H-imidazol-5-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 2-(4-Formylphenyl)-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[(1E)-3-(4-methylpiperazin-1-yl)-3-oxoprop-1-enyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[3-(4-Methylpiperazin-1-yl)prop-1-ynyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 10 2-[4-[(4-Methylpiperazin-1-yl)methyl]phenyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{1-methyl-2-[(4-methylpiperazin-1-yl)methyl]-1H-imidazol-5-yl} thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(4-methylpiperazin-1-yl)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 15 2-[4-[(Dimethylamino)methyl]phenyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-[(dimethylamino)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-[(diethylamino)methyl]phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-ethylpiperazin-1-ylmethyl)phenyl]thieno [3,2-b]pyridine-6-carbonitrile;
- 7-[(2-Chloro-5-methoxyphenyl)amino]-2-[4-[(dimethylamino)methyl]phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2-Chloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]thieno [3,2-b]pyridine-6-carbonitrile;

- 2-{4-[(Dimethylamino)methyl]phenyl}7-[(5-methoxy-2-methylphenyl)amino]-thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(5-Methoxy-2-methylphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl) phenyl] thieno [3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-Dichlorophenyl)amino]-2-{4[(dimethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichlorophenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl) phenyl] thieno [3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[6-(4-methylpiperazin-1-ylmethyl)pyridin-3-yl] thieno [3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{6-[(dimethylamino)methyl]pyridin-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(4-methylpiperazin-1-ylmethyl)furan-3-yl] thieno [3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{5-[(dimethylamino)methyl]furan-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl)amino]-2-iodothieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl)amino]-2-[4-(morpholin-4-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl)amino]-2-[4-(morpholin-4-ylbut-1-ynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl)amino]-2-[3-(dimethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl)amino]-2-(4-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;

- 7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-{4-[(4-methylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-[3-(diethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(5-formyl-2-furyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[5-(1,3-dioxolan-2-yl)-2-furyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]-2-furyl}thieno [3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(4-ethylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(4-pyrrolidin-1-yl)piperidin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{[[2-(dimethylamino)ethyl](methyl)amino]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(dimethylamino)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{3-[(4-methylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{3-[(dimethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(dimethylamino)methyl]-2-furyl}thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[5-(1,3-dioxolan-2-yl)thien-2-yl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(2-formylthien-3-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(5-formylthien-2-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(dimethylamino)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]thien-2-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{2-[(4-methylpiperazin-1-yl)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{[[3-(dimethylamino)propyl](methyl)amino]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-({6-[(dimethylamino)methyl]pyridin-2-yl}ethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(dimethylamino)methyl]thien-2-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{[(pyridin-4-yl)methyl]amino]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(1H-pyrrol-3-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{[(2-methoxyethyl)amino]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-({[2-(methylthio)ethyl]amino)methyl}phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(thiomorpholin-4-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(piperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-morpholin-4-ylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-({[3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl]amino)-2-(4-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-({[3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl]amino)-2-{4-[(diethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-({5-[(dimethylamino)methyl]pyridin-2-yl}ethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(1H-pyrazol-4-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichlorophenyl)amino]-2-iodothieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]pyridin-2-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 20 2-{4-[(butylamino)methyl]phenyl}-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(1-oxidothiomorpholin-4-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(diethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 25

- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-[(3-hydroxypropyl)amino]methyl)phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[5-(morpholin-4-ylmethyl)pyridin-2-yl]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(6-morpholin-4-ylpyridin-3-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-ethoxyphenyl)amino]-2-iodothieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(1,1-dioxidothiomorpholin-4-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(4-pyridin-2-ylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(4-phenylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4{[(2R,5S)-2,5-dimethylpiperazin-1-yl]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-dichlorophenyl)amino]-2-(4-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-ethoxyphenyl)amino]-2-(4-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[(4-methylpiperazin-1-yl)carbonyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-dichlorophenyl)amino]-2-{4-[(4-methylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{4-(2-methoxyphenyl)piperazin-1-yl}methyl)phenyl)thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-[(3-methylbutyl)amino]methyl)phenylthieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{[4-(methylsulfonyl)piperazin-1-yl]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-dichloro-5-ethoxyphenyl)amino]-2-{4-[(4-methylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(4-{[4-(pyridin-2-ylmethyl)piperazin-1-yl]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{1-[2-(dimethylamino)ethyl]-1H-pyrrol-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichlorophenyl)amino]-2-[4-(dimethylamino)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[(1-methyl-1H-imidazol-5-yl)ethynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{6-[(dimethylamino)methyl]pyridin-2-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(1H-pyrazol-4-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{[1-(2-hydroxyethyl)-1H-pyrazol-4-yl]ethynyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[1-(2-morpholin-4-ylethyl)-1H-pyrazol-4-yl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(dimethylamino)methyl]pyridin-2-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(diethylamino)methyl]pyridin-2-yl}thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{4-[2-(dimethylamino)ethyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[1-(2-hydroxyethyl)-1H-pyrazol-4-yl]thieno[3,2-b]pyridine-6-carbonitrile;

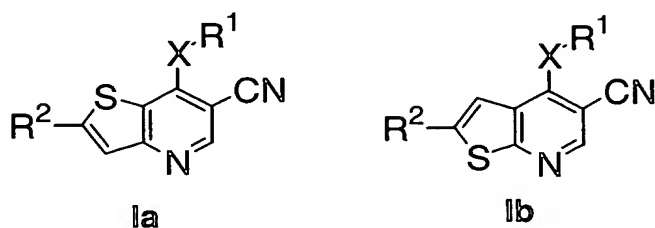
- 5 4-{6-cyano-7-[(2,4-dichloro-5-methoxyphenyl)amino]thieno[3,2-b]pyridin-2-yl}-N,N-dimethylbenzamide;

7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]-3-furyl}thieno[3,2-b]pyridine-6-carbonitrile; and

- 10 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-(5-formyl-3-furyl)thieno[3,2-b]pyridine-6-carbonitrile.

12. A compound of formula Ia or Ib according to claim 1 wherein R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴ and YR⁷; and R⁷ is an aryl or heteroaryl ring, optionally substituted with one to four substituents selected from the group consisting of -H, -J, -CF₃, -OCF₃, -R⁴ and OR⁴.
- 15

13. A compound of Formula (1a) and Formula (1b)



wherein:

X is -NH-;

5 q = 1-3;

R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -Cl, -R⁴, -OR⁴;

R² is R³ where R³ is substituted aryl or heteroaryl, wherein the substituent may be one or more groups selected from -(C(R⁹)₂)ₐQ;

10 R⁴ is alkyl of 1-6 carbon atoms;

R⁹ is H;

Q is NZZ' wherein Z and Z' may be the same or different and may be H, alkyl of 1 to 6 carbon atoms;

15 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen and oxygen, said ring may be substituted on nitrogen or carbon by R⁴ or on carbon by (CH₂)₂OH; or

a pharmaceutically acceptable salt thereof.

14. A compound of claim 13 comprising

20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl) phenyl] thieno [3,2-b]pyridine-6-carbonitrile;

2-{4-[(Dimethylamino)methyl]phenyl}-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-[(dimethylamino)methyl]phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 5 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-morpholinylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-{[4-(2-hydroxyethyl)piperazin-1-yl]methyl}phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 10 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(piperidin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;

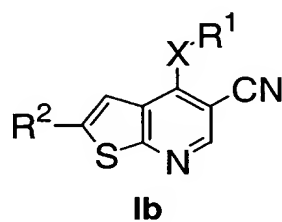
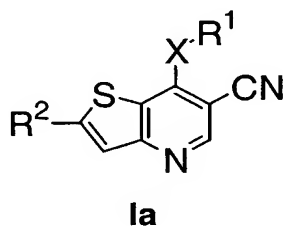
7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(morpholin-4-ylmethyl)thien-3-yl]thieno[3,2-b]pyridine-6-carbonitrile;

- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-{[4-hydroxypiperidin-1-yl]methyl}phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[4-methylpiperazin-1-yl)methyl]pyridin-2-yl}thienol[3,2-b]pyridine-6-carbonite; and

- 20 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(piperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile.

15. A compound of Formula (1a) and Formula (1b)



wherein:

X is -NH-;

n is an integer of 2-5

q is an integer of 0-5;

- 5 R^1 is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴, or YR⁷;

R^2 is R³ where R³ is alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

and may be substituted by one or more groups selected from

- R⁸, -(CH₂)_qOR⁸, -(CH₂)_qNHR⁸, -(CH₂)_qNR⁴R⁸, -(CH₂)_qQ,
 10 -O(CH₂)_nOR⁸, -NH(CH₂)_nOR⁸, -NR⁴(CH₂)_nOR⁸,
 -O(CH₂)_nNHR⁸, -NH(CH₂)_nNHR⁸, -NR⁴(CH₂)_nNHR⁸,
 -O(CH₂)_nNR⁴R⁸, -NH(CH₂)_nCR⁸, -NR⁴(CH₂)_nNR⁴R⁸,
 -O(CH₂)_nQ, -NH(CH₂)_nQ, -NR⁴(CH₂)_nQ,
 -O(CH₂)_qR⁸; -NH(CH₂)_qR⁸; or -NR⁴(CH₂)_qR⁸;

- 15 R^4 is H, alkyl of 1-6 carbon atoms;

R^7 is an aryl or heteroaryl ring, optionally substituted with one to four substituents selected from the group consisting of -H, -J, -CF₃, -OCF₃, -R⁴, -OR⁴;

R^8 is -H, alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

- 20 Y is -C(O)-, -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHSO₂-, -S-, -O-, -NR⁴-;

Q is NZZ' wherein Z and Z' may be the same or different and are selected from H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

5 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with -R⁴ on a carbon or a nitrogen, or on nitrogen by a group -(CH₂)_nOR³, -(CH₂)_nNHR³, -(CH₂)_nNR⁴R³, -(CH₂)_nNZ''Z''', or on carbon by a group -(CH₂)_qOR³, -(CH₂)_qNHR³, -(CH₂)_qNR⁴R³, -(CH₂)_qNZ''Z'''

10 Z''' and Z'' may be the same or different and are selected from H, alkyl of 1 to 6 carbon atoms

Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from nitrogen, oxygen and sulfur;

15 And J is fluoro, chloro, bromo and iodo

16. A compound of claim 15 comprising:

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-phenylthieno[3,2-b]pyridine-6-carbonitrile;

20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-morpholinylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(4-{[4-(2-hydroxyethyl)piperazin-1-yl]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;

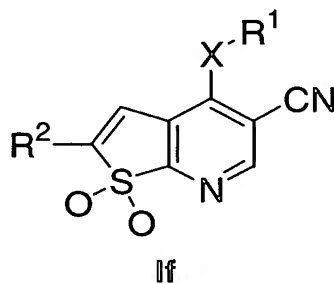
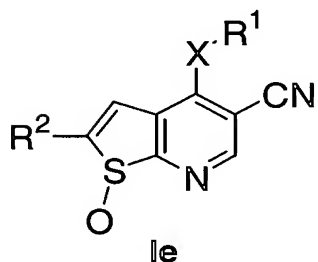
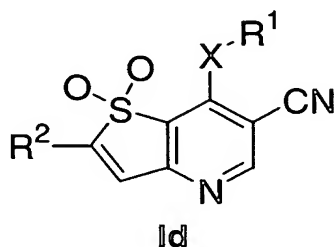
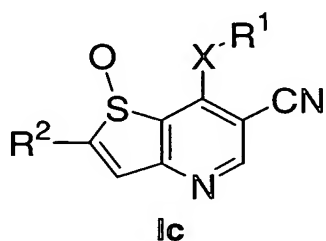
25 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(piperidin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[(4-methoxyphenyl)ethynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-2-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(dimethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(morpholin-4-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 10 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(morpholin-4-ylmethyl)phenyl]thieno[2,3-b]pyridine-5-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-ethynylthieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-4-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-3-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(morpholin-4-ylmethyl)thien-3-yl]thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(4-hydroxypiperidin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(hydroxymethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 25 2-[4-(4-Methylpiperazin-1-ylmethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;

- 2-[4-(Morpholin-4-ylmethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[4-(Hydroxymethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(4-Phenoxyphenyl)amino]-2-[(E)-2-pyridin-4-ylethenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(4-methylpiperazin-1-yl)prop-1-ynyl]thieno[2,3-b]pyridine-5-carbonitrile;
- 10 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-3-ylethynyl)thieno[2,3-b]pyridine-5-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(2-formyl-1-methyl-1H-imidazol-5-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[3-(4-Methylpiperazin-1-yl)prop-1-ynyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 15 2-{4-[(4-Methylpiperazin-1-yl)methyl]phenyl}-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{1-methyl-2-[(4-methylpiperazin-1-yl)methyl]-1H-imidazol-5-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(4-methylpiperazin-1-yl)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-{4-[(Dimethylamino)methyl]phenyl}-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile; and
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(dimethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile.
- 25 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[4-methylpiperazin-1-yl)methyl]pyridin-2-yl}thieno[3,2-b]pyridine-6-carbonitrile; and

7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(piperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile.

17. A compound as claimed in claim 1 which is an S-oxide or S-dioxide of
5 Formula (1c), Formula (1d), (1e) or (1f):



wherein: X, R¹ and R² are as defined in claim 1.

18. A compound according to claim 17 which is one of the following:
- 10 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]-1-oxo-1H-thieno [3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]-1,1-dioxo-1H-thieno [3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-[(dimethylamino)methyl]phenyl]-1-oxo-15 1H-thieno[3,2-b]pyridine-6-carbonitrile;

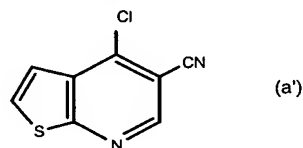
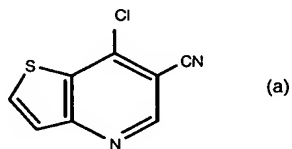
7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(dimethylamino)methyl]phenyl}-1,1-dioxo-1H-thieno[3,2-b]pyridine-6-carbonitrile;

2-{4-[(Dimethylamino)methyl]phenyl}-1-oxo-7-[(3,4,5-trimethoxyphenyl)amino]-1H-thieno[3,2-b]pyridine-6-carbonitrile; or

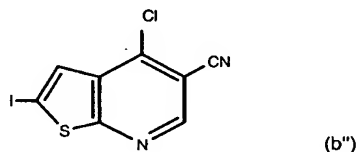
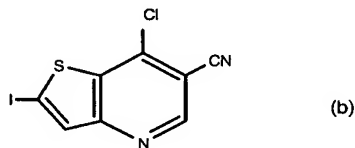
- 5 2-{4-[(Dimethylamino)methyl]phenyl}-1,1-dioxo-7-[(3,4,5-trimethoxyphenyl)amino]-1H-thieno[3,2-b]pyridine-6-carbonitrile.

19. A process of producing a compound of Formula (Ia) and Formula (Ib) of claim 1, wherein R² is iodine, comprising:

- 10 a) treating with a base, in an inert solvent at reduced temperature a compound of Formula (a) or (a');;

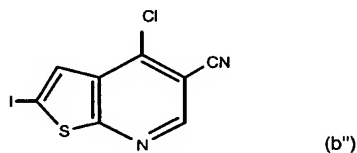
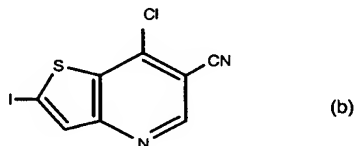


- 15 b.) adding iodine to the compound in step (a) to form a compound of Formula (b) or (b'); and



c.) adding a compound of formula R^1XH to the compound in step (b) to form a compound of Formula (Ia) or (Ib), wherein R^2 is iodine.

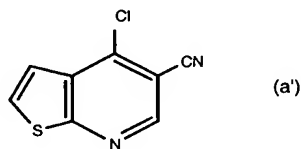
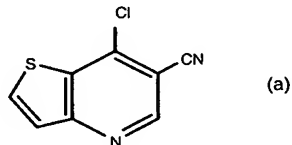
20. A compound of Formula (b) or (b')



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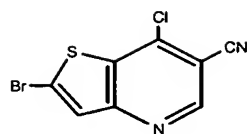
21. A process of producing a compound of Formula (Ia) or (Ib) of claim 1, wherein R^2 is bromine, comprising:

a.) treating with a base, in an inert solvent at reduced temperature a compound of Formula (a) or (a');

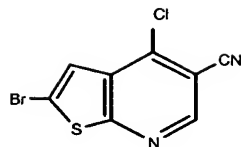


10

b.) adding 1,1-dibromo-1,1,2,2-tetrafluoroethane or bromine to the compound in step (a) to form a compound of Formula (z) or (z'); and



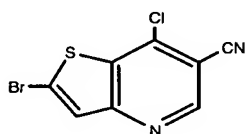
(z)



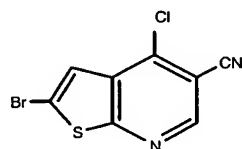
(z')

c.) adding a compound of formula R^1XH to the compound in step (b) to form a compound of Formula (Ia) or (Ib), wherein R^2 is bromine.

5 22. A compound of Formula (z) or (z')



(z)



(z')

23. A method of treating or inhibiting a pathological condition or disorder in a mammal which comprises providing to said mammal an effective amount of a compound of Formula (Ia) and (Ib) or an S-oxide or S-dioxide thereof or a
10 pharmaceutically acceptable salt thereof.

24. A method of claim 23 wherein the pathological condition or disorder is cancer.

25. A method of claim 23 wherein the pathological condition or disorder is stroke.

15 26. A method of claim 23 wherein the pathological condition or disorder is osteoporosis.

27. A method of claim 23 wherein the pathological condition or disorder is polycystic kidney disease.

28 A method of claim 23 wherein the pathological condition or disorder is neuropathic pain.

5 29. A method of claim 23 wherein the pathological condition or disorder comprises autoimmune disease, rheumatoid arthritis, and transplant rejection.

30. A method of treating or inhibiting a pathological condition or disorder mediated in a mammal which comprises providing to said mammal an effective amount of a compound of Formula (Ia) and (Ib) or a pharmaceutically acceptable salt thereof.

10

31. The method of claim 30 in which:

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl) phenyl]thieno [3,2-b]pyridine-6-carbonitrile;

15 2-{4-[(Dimethylamino)methyl]phenyl}-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(dimethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;

20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-morpholinylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(4-{[4-(2-hydroxyethyl)piperazin-1-yl]methyl}phenyl)thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(piperidin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

25 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(morpholin-4-ylmethyl)thien-3-yl]thieno[3,2-b]pyridine-6-carbonitrile; and

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(4-hydroxypiperidin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile,

- 5 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[4-methylpiperazin-1-yl)methyl]pyridin-2-yl}thienol[3,2-b]pyridine-6-carbonite; and

7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(piperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile,

is provided.

- 10 32. A method of claim 30 wherein the pathological condition or disorder is cancer.

33. A method of claim 30 wherein the pathological condition or disorder is osteoporosis.

- 15 34. A method of claim 30 wherein the pathological condition or disorder is polycystic kidney disease.

35. A method of claim 30 wherein the pathological condition or disorder comprises autoimmune disease, rheumatoid arthritis, and transplant rejection.

36. A method of claim 30 wherein the pathological condition or disorder is neuropathic pain.

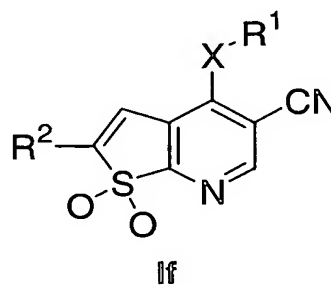
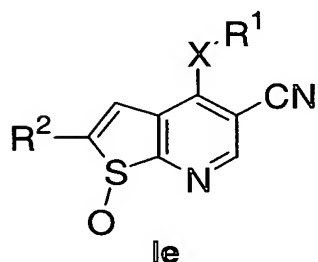
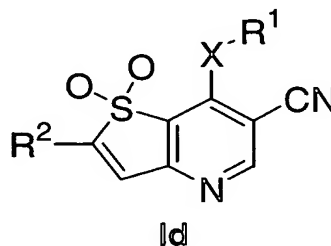
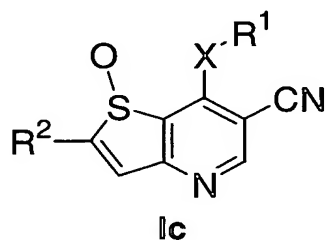
- 20 37. A method of claim 30 wherein the pathological condition or disorder is stroke.

38. A pharmaceutical composition comprising a compound of Formula (1a) and (1b) or a pharmaceutically acceptable salt thereof.

- 25 39. A pharmaceutical composition of formula 1a or 1b according to claim 38 wherein X is NH.

40. A pharmaceutical composition of formula Ia or Ib according to claim 38 wherein R^1 is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴ and YR⁷; and R⁷ is an aryl or heteroaryl ring, optionally substituted with one to four substituents selected from the group consisting of -H, -J, -CF₃, -OCF₃, -R⁴ and OR⁴.

41. A pharmaceutical composition comprising a compound of Formula (Ic), (Id), (Ie) and (If)



wherein:

X is -NH-, -NR⁴-, -O-, -S(O)_m-, -NHCH₂-;

m is an integer of 0-2;

n is an integer of 2-5;

q is an integer of 0-5;

R^1 is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -NO₂, -CN, -N₃, -CHO, -CF₃, -OCF₃, -R⁴, -OR⁴, -S(O)_mR⁴,

- NR⁴R⁴, -NR⁴S(O)_mR⁴, -OR⁶OR⁴, -OR⁶NR⁴R⁴, -N(R⁴)R⁶OR⁴, -N(R⁴)R⁶NR⁴R⁴, -NR⁴C(O)R⁴, -C(O)R⁴, -C(O)OR⁴, -C(O)NR⁴R⁴, -OC(O)R⁴, -OC(O)OR⁴, -OC(O)NR⁴R⁴, NR⁴C(O)R⁴, -NR⁴C(O)OR⁴, -NR⁴C(O)NR⁴R⁴, -R⁵OR⁴, -R⁵NR⁴R⁴, -R⁵S(O)_mR⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵OC(O)R⁴, -R⁵OC(O)OR⁴, -R⁵OC(O)NR⁴R⁴, -R⁵NR⁴C(O)R⁴, -R⁵NR⁴C(O)OR⁴, -R₅NR₄C(O)NR⁴R⁴, or YR⁷;

R² is -H, -R³, -J, -C(O)XR³, -CHO, wherein the R³ group may be substituted by one or more groups selected from -C(O)XR⁸, -CHO, -C(O)Q, 1,3-dioxolane, -R⁸, -(C(R⁹)₂)_qXR⁸, -(C(R⁹)₂)_qQ, -X(C(R⁹)₂)_nXR⁸, -X(C(R⁹)₂)_nQ, or -X(C(R⁹)₂)_qR⁸;

- R³ is alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

R⁴ is H, alkyl of 1-6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, a *trans*-alkenyl of 2-6 carbon atoms, or an alkynyl of 2-6 carbon atoms;

R⁵ is a divalent group comprising alkyl of 1-6 carbon atoms, alkenyl of 2-6 carbon atoms, and alkynyl of 2-6 carbon atoms;

- R⁶ is a divalent alkyl group of 2-6 carbon atoms;

- R⁷ is a cycloalkyl ring of 3-7 carbons optionally substituted with one to four substituents selected from the group consisting of alkyl groups of 1 to 6 carbons, an aryl or heteroaryl ring, a aryl or heteroaryl fused to one to three aryl or heteroaryl rings, wherein any of the aryl or heteroaryl rings may be optionally substituted with one to four substituents selected from the group consisting of -H, -aryl, -CH₂-aryl, -NH-aryl, -O-aryl, -S(O)_m-aryl, -J, -NO₂, -CN, -N₃, -CHO, -CF₃, -OCF₃, -R⁴, -OR⁴, -S(O)_mR⁴, -NR⁴R⁴, -NR⁴S(O)_mR⁴, -OR⁶OR⁴, -OR⁶NR⁴R⁴, -N(R⁴)R⁶OR⁴, -N(R⁴)R⁶NR⁴R⁴, -NR⁴C(O)R⁴, -C(O)R⁴, -C(O)OR⁴, -C(O)NR⁴R⁴, -OC(O)R⁴, -OC(O)OR⁴, -OC(O)NR⁴R⁴, -NR⁴C(O)R⁴, -NR⁴C(O)OR⁴, -NR⁴C(O)NR⁴R⁴, -R⁵OR⁴, R⁵NR⁴R⁴, -R⁵S(O)_mR⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵OC(O)R⁴, -R⁵OC(O)OR⁴, -R⁵OC(O)NR⁴R⁴, -R⁵NR⁴C(O)R⁴, -R⁵NR⁴C(O)OR⁴, or -R⁵NR⁴C(O)NR⁴R⁴;

R⁸ is -H, alkenyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

R⁹ is -R⁴ or -F;

Y is -C(O)-, -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHSO₂-, -SO₂NH-, -C(OH)H-, -X(C(R⁹)₂)_q-, -(C(R⁹)₂)_q-, -(C(R⁹)₂)_qX-, -C≡C-, *cis*- and *trans*- -CH=CH- and cycloalkyl of 3-10 carbon atoms;

- 5 Q is NZZ' wherein Z and Z' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen,
 10 oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with -R⁴ on a carbon or a nitrogen, or on nitrogen by a group - (C(R⁹)₂)_nXR³, -C(R⁹)₂)_nNZ''Z''', or on carbon by a group -(C(R⁹)₂)_qXR³, - (C(R⁹)₂)_qNZ''Z'''',

wherein Z'' and Z''' may be the same or different and are H, alkyl of 1 to 6 carbon
 15 atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from nitrogen, oxygen and sulfur; and

J is fluoro, chloro, bromo, and iodo, and a pharmaceutically acceptable carrier.

- 20 42. A pharmaceutical composition of claim 41 wherein the compound comprises:

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]-1-oxo-1H-thieno [3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]-
 25 1,1-dioxo-1H-thieno [3,2-b]pyridine-6-carbonitrile;

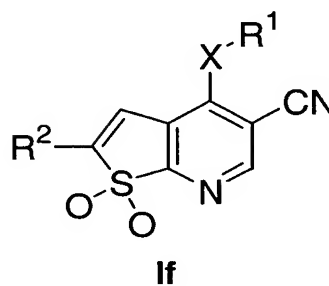
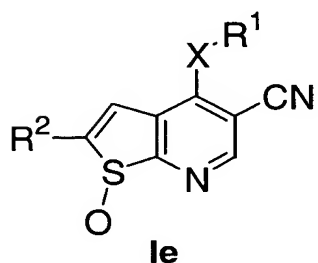
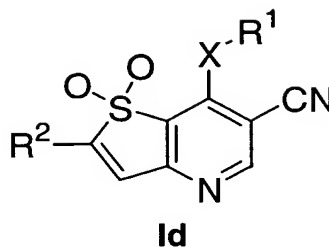
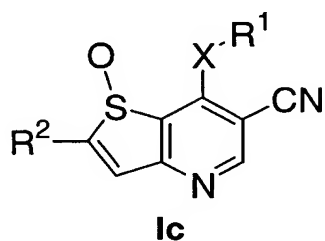
7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(dimethylamino)methyl]phenyl}-1-oxo-1H-thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(dimethylamino)methyl]phenyl}-1,1-dioxo-1H-thieno[3,2-b]pyridine-6-carbonitrile;

2-{4-[(Dimethylamino)methyl]phenyl}-1-oxo-7-[(3,4,5-trimethoxyphenyl)amino]-1H-thieno[3,2-b]pyridine-6-carbonitrile; and

- 5 2-{4-[(Dimethylamino)methyl]phenyl}-1,1-dioxo-7-[(3,4,5-trimethoxyphenyl)amino]-1H-thieno[3,2-b]pyridine-6-carbonitrile and a pharmaceutically acceptable carrier.

43. A compound of Formula (1c), Formula (1d), (1e), and (1f)



wherein:

5 X is -NH-;

q is an integer of 0-5;

R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴, or YR⁷;

10 R² is -R³, wherein R³ is alkynyl of 2-6 carbon atoms, aryl or heteroaryl, group may be one groups selected from -C(O)XR⁸, -CHO, -C(O)Q, 1,3-dioxolane, -R⁸;

R⁴ is H, alkyl of 1-6 carbon atoms;

R⁷ is an aryl or heteroaryl ring optionally substituted with one to four substituents selected from the group consisting of -H, -CF₃, -OCF₃, -R⁴, -OR⁴;

15 R⁸ is -H, alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

Y is -C(O)-, -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHSO₂-;

Q is NZZ' wherein Z and Z' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

- 5 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with -R⁴ on a carbon or a nitrogen, or on nitrogen by a group - (C(R⁹)₂)_nXR³, -C(R⁹)₂)_nNZ''Z'''', or on carbon by a group -(C(R⁹)₂)_qXR³, -
- 10 (C(R⁹)₂)_qNZ''Z'''',

wherein Z'' and Z''' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from

15 nitrogen, oxygen and sulfur; and

J is fluoro, chloro, bromo, and iodo, and a pharmaceutically acceptable carrier.

44. A pharmaceutical composition of claim 41 wherein the compound comprises:

20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]-1-oxo-1H-thieno [3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]-1,1-dioxo-1H-thieno [3,2-b]pyridine-6-carbonitrile;

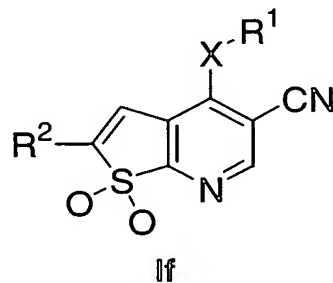
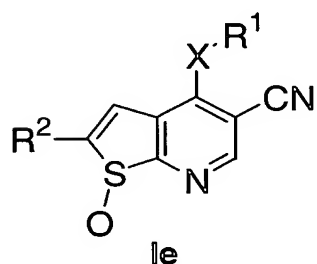
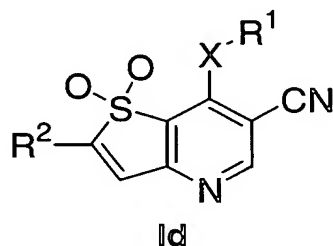
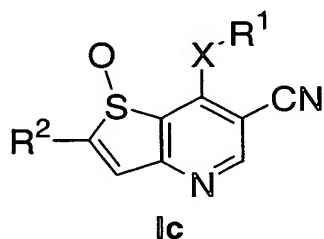
7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-[(dimethylamino)methyl]phenyl]-1-oxo-1H-thieno[3,2-b]pyridine-6-carbonitrile;

25 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-[(dimethylamino)methyl]phenyl]-1,1-dioxo-1H-thieno[3,2-b]pyridine-6-carbonitrile;

2-{4-[(Dimethylamino)methyl]phenyl}-1-oxo-7-[(3,4,5-trimethoxyphenyl)amino]-1H-thieno[3,2-b]pyridine-6-carbonitrile; and

2-{4-[(Dimethylamino)methyl]phenyl}-1,1-dioxo-7-[(3,4,5-trimethoxyphenyl)amino]-1H-thieno[3,2-b]pyridine-6-carbonitrile and a pharmaceutically acceptable carrier.

- 5 45. A method of treating or inhibiting a pathological condition or disorder mediated in a mammal which comprises providing to said mammal an effective amount of a compound of Formula (Ic), (Id), (Ie) and (If)



- 10 wherein:

X is -NH-, -NR⁴-, -O-, -S(O)_m-, -NHCH₂-;

m is an integer of 0-2;

n is an integer of 2-5;

q is an integer of 0-5;

- 15 R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -NO₂, -CN, -N₃, -CHO, -CF₃, -OCF₃, -R⁴, -OR⁴, -S(O)_mR⁴,

- NR⁴R⁴, -NR⁴S(O)_mR⁴, -OR⁶OR⁴, -OR⁶NR⁴R⁴, -N(R⁴)R⁶OR⁴, -N(R⁴)R⁶NR⁴R⁴, -NR⁴C(O)R⁴, -C(O)R⁴, -C(O)OR⁴, -C(O)NR⁴R⁴, -OC(O)R⁴, -OC(O)OR⁴, -OC(O)NR⁴R⁴, NR⁴C(O)R⁴, -NR⁴C(O)OR⁴, -NR⁴C(O)NR⁴R⁴, -R⁵OR⁴, -R⁵NR⁴R⁴, -R⁵S(O)_mR⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵OC(O)R⁴, -R⁵OC(O)OR⁴, -R⁵OC(O)NR⁴R⁴, -R⁵NR⁴C(O)R⁴, -R⁵NR⁴C(O)OR⁴, -R₅NR₄C(O)NR⁴R⁴, or YR⁷;

R² is -H, -R³, -J, -C(O)XR³, -CHO, wherein the R³ group may be substituted by one or more groups selected from -C(O)XR⁸, -CHO, -C(O)Q, 1,3-dioxolane, -R⁸, -(C(R⁹)₂)_qXR⁸, -(C(R⁹)₂)_qQ, -X(C(R⁹)₂)_nXR⁸, -X(C(R⁹)₂)_nQ, or -X(C(R⁹)₂)_qR⁸;

- R³ is alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

R⁴ is H, alkyl of 1-6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, a *trans*-alkenyl of 2-6 carbon atoms, or an alkynyl of 2-6 carbon atoms;

R⁵ is a divalent group comprising alkyl of 1-6 carbon atoms, alkenyl of 2-6 carbon atoms, and alkynyl of 2-6 carbon atoms;

- R⁶ is a divalent alkyl group of 2-6 carbon atoms;

- R⁷ is a cycloalkyl ring of 3-7 carbons optionally substituted with one to four substituents selected from the group consisting of alkyl groups of 1 to 6 carbons, an aryl or heteroaryl ring, a aryl or heteroaryl fused to one to three aryl or heteroaryl rings, wherein any of the aryl or heteroaryl rings may be optionally substituted with one to four substituents selected from the group consisting of -H, -aryl, -CH₂-aryl, -NH-aryl, -O-aryl, -S(O)_m-aryl, -J, -NO₂, -CN, -N₃, -CHO, -CF₃, -OCF₃, -R⁴, -OR⁴, -S(O)_mR⁴, -NR⁴R⁴, -NR⁴S(O)_mR⁴, -OR⁶OR⁴, -OR⁶NR⁴R⁴, -N(R⁴)R⁶OR⁴, -N(R⁴)R⁶NR⁴R⁴, -NR⁴C(O)R⁴, -C(O)R⁴, -C(O)OR⁴, -C(O)NR⁴R⁴, -OC(O)R⁴, -OC(O)OR⁴, -OC(O)NR⁴R⁴, -NR⁴C(O)R⁴, -NR⁴C(O)OR⁴, -NR⁴C(O)NR⁴R⁴, -R⁵OR⁴, R⁵NR⁴R⁴, -R⁵S(O)_mR⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵C(O)R⁴, -R⁵C(O)OR⁴, -R⁵C(O)NR⁴R⁴, -R⁵OC(O)R⁴, -R⁵OC(O)OR⁴, -R⁵OC(O)NR⁴R⁴, -R⁵NR⁴C(O)R⁴, -R⁵NR⁴C(O)OR⁴, or -R⁵NR⁴C(O)NR⁴R⁴;

R⁸ is -H, alkenyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

R^9 is $-R^4$ or $-F$;

Y is $-C(O)-$, $-C(O)O-$, $-OC(O)-$, $-C(O)NH-$, $-NHC(O)-$, $-NHSO_2-$, $-SO_2NH-$, $-C(OH)H-$, $-X(C(R^9)_2)_q-$, $-(C(R^9)_2)_q-$, $-(C(R^9)_2)_qX-$, $-C\equiv C-$, *cis*- and *trans*- $-CH=CH-$ and cycloalkyl of 3-10 carbon atoms;

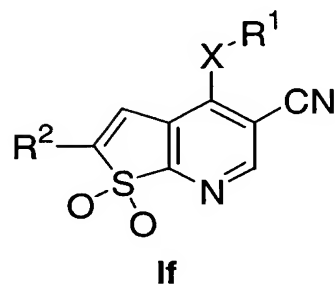
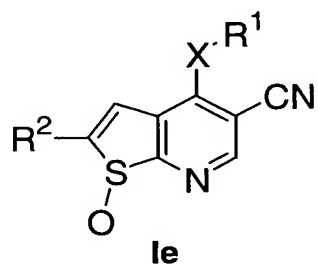
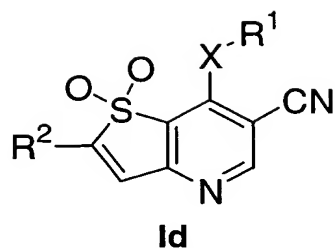
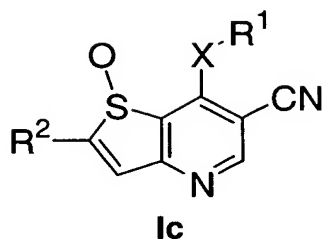
- 5 Q is NZZ' wherein Z and Z' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

10 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with $-R^4$ on a carbon or a nitrogen, or on nitrogen by a group $-(C(R^9)_2)_nXR^3$, $-(C(R^9)_2)_nNZ''Z'''$, or on carbon by a group $-(C(R^9)_2)_qXR^3$, $-(C(R^9)_2)_qNZ''Z'''$,

15 wherein Z'' and Z''' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from nitrogen, oxygen and sulfur; and

J is fluoro, chloro, bromo, and iodo, and a pharmaceutically acceptable carrier.

- 20 46. The method of claim 45 in which:



wherein:

X is -NH-;

5 q is an integer of 0-5;

R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴, or YR⁷;

R² is R³ where R³ is alkynyl of 2-6 carbon atoms, aryl or heteroaryl; and may be substituted by groups selected from -C(O)XR⁸, -CHO, -C(O)Q, 1,3-dioxolane, -R⁸;

10 R⁴ is H, alkyl of 1-6 carbon atoms;

R⁷ is an aryl or heteroaryl ring, optionally substituted with one to four substituents selected from the group consisting of -H, -J, -CF₃, -OCF₃, -R⁴, or -OR⁴;

R⁸ is -H, alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

15 Y is -C(O)-, -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHSO₂-, -S-, -O-, -NR⁴-;

Q is NZZ' wherein Z and Z' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

5 Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with -R⁴ on a carbon or a nitrogen, or on nitrogen by a group - (C(R⁹)₂)_nXR³, -C(R⁹)₂)_nNZ''Z''', or on carbon by a group -(C(R⁹)₂)_qXR³, - (C(R⁹)₂)_qNZ''Z'''

10 wherein Z'' and Z''' may be the same or different and are H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from nitrogen, oxygen and sulfur; and

15 J is fluoro, chloro, bromo, and iodo, and a pharmaceutically acceptable carrier.

47. A method of claim 45 wherein the pathological condition or disorder is cancer.

48. A method of claim 45 wherein the pathological condition or disorder is stroke.

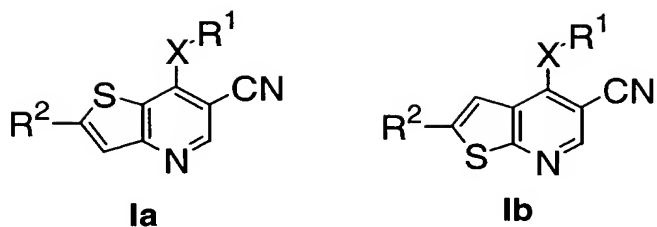
20 49. A method of claim 45 wherein the pathological condition or disorder is osteoporosis.

50. A method of claim 45 wherein the pathological condition or disorder is polycystic kidney disease.

51. A method of claim 45 wherein the pathological condition or disorder comprises autoimmune disease, rheumatoid arthritis, and transplant rejection.

25 52. A method of claim 45 wherein the pathological condition or disorder is neuropathic pain.

53. A compound of Formula (1a) and Formula (1b)



wherein:

X is -NH-,

5 n is an integer of 2-5;

q is an integer of 0-5;

R¹ is a phenyl ring optionally substituted with one to four substituents selected from the group consisting of -J, -CF₃, -OCF₃, -R⁴, -OR⁴, or YR⁷;

R² is R³ where R³ is alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

10 and may be substituted by one or more groups selected from

-R⁸, -(CH₂)_qOR⁸, -(CH₂)_qNHR⁸, -(CH₂)_qNR⁴R⁸, -(CH₂)_qQ,

-O(CH₂)_nOR⁸, -NH(CH₂)_nOR⁸, -NR⁴(CH₂)_nOR⁸,

-O(CH₂)_nNHR⁸, -NH(CH₂)_nNHR⁸, -NR⁴(CH₂)_nNHR⁸,

-O(CH₂)_nNR⁴R⁸, -NH(CH₂)_nCR⁸, -NR⁴(CH₂)_nNR⁴R⁸,

15 -O(CH₂)_nQ, -NH(CH₂)_nQ, -NR⁴(CH₂)_nQ,

-O(CH₂)_qR⁸; -NH(CH₂)_qR⁸; or -NR⁴(CH₂)_qR⁸;

R⁴ is H, alkyl of 1-6 carbon atoms;

R⁷ is an aryl or heteroaryl ring, optionally substituted with one to four substituents selected from the group consisting of -H, -J, -CF₃, -OCF₃, -R⁴, -OR⁴;

R⁸ is -H, alkyl of 1 to 6 carbon atoms, *cis*-alkenyl of 2-6 carbon atoms, *trans*-alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl or heteroaryl;

Y is -C(O)-, -C(O)O-, -OC(O)-, -C(O)NH-, -NHC(O)-, -NHSO₂-, -S-, -O-, -NR⁴-;

Q is NZZ' wherein Z and Z' may be the same or different and are selected from H, alkyl of 1 to 6 carbon atoms, alkenyl of 2-6 carbon atoms, alkynyl of 2-6 carbon atoms, aryl, or heteroaryl, and

Z and Z' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may have an additional heteroatom selected from nitrogen, oxygen, and sulfur, and may comprise morpholine, piperazine, piperidine, optionally substituted with -R⁴ on a carbon or a nitrogen, or on nitrogen by a group -(CH₂)_nOR³, -(CH₂)_nNHR³, -(CH₂)_nNR⁴R³, -(CH₂)_nNZ''Z''', or on carbon by a group -(CH₂)_qOR³, -(CH₂)_qNHR³, -(CH₂)_qNR⁴R³, -(CH₂)_qNZ''Z'''

Z''' and Z'' may be the same or different and are selected from H, alkyl of 1 to 6 carbon atoms

Z'' and Z''' taken together with the nitrogen to which they are attached may form a heterocyclic ring which may contain an additional heteroatom selected from nitrogen, oxygen and sulfur;

And J is fluoro, chloro, bromo and iodo and a pharmaceutically acceptable carrier.

54. A compound of claim 53 comprising:

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-phenylthieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-morpholinylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(4-methylpiperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(4-{[4-(2-hydroxyethyl)piperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(piperidin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[(4-methoxyphenyl)ethynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-2-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(dimethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(morpholin-4-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(morpholin-4-ylmethyl)phenyl]thieno[2,3-b]pyridine-5-carbonitrile;
- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-ethynylthieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-4-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-3-ylethynyl)thieno[3,2-b]pyridine-6-carbonitrile;
- 20 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{5-[(4-methylpiperazin-1-yl)methyl]thien-3-yl}thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[5-(morpholin-4-ylmethyl)thien-3-yl]thieno[3,2-b]pyridine-6-carbonitrile;
- 25 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(4-hydroxypiperidin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;

- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[4-(hydroxymethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[4-(4-Methylpiperazin-1-ylmethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 5 2-[4-(Morpholin-4-ylmethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[4-(Hydroxymethyl)phenyl]-7-[(4-phenoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 10 7-[(4-Phenoxyphenyl)amino]-2-[(E)-2-pyridin-4-ylethenyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(4-methylpiperazin-1-yl)prop-1-ynyl]thieno[2,3-b]pyridine-5-carbonitrile;
- 4-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(pyridin-3-ylethynyl)thieno[2,3-b]pyridine-5-carbonitrile;
- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-(2-formyl-1-methyl-1H-imidazol-5-yl)thieno[3,2-b]pyridine-6-carbonitrile;
- 2-[3-(4-Methylpiperazin-1-yl)prop-1-ynyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 20 2-[4-[(4-Methylpiperazin-1-yl)methyl]phenyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{1-methyl-2-[(4-methylpiperazin-1-yl)methyl]-1H-imidazol-5-yl} thieno[3,2-b]pyridine-6-carbonitrile;
- 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-[3-(4-methylpiperazin-1-yl)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;
- 25 2-[4-[(Dimethylamino)methyl]phenyl]-7-[(3,4,5-trimethoxyphenyl)amino]thieno[3,2-b]pyridine-6-carbonitrile;

7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-iodothieno[3,2-b]pyridine-6-carbonitrile;

7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-[4-(morpholin-4-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 5 7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-[4-(morpholin-4-ylbut-1-ynyl)thieno[3,2-b]pyridine-6-carbonitrile;

7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-[3-(dimethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile;

- 10 7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-(4-formylphenyl)thieno[3,2-b]pyridine-6-carbonitrile;

7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-{4-[(4-methylpiperazin-1-yl)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;

7-({3-chloro-4-[(1-methyl-1H-imidazol-2-yl)thio]phenyl}amino)-2-[3-(diethylamino)prop-1-ynyl]thieno[3,2-b]pyridine-6-carbonitrile; and

- 15 7-[(2,4-Dichloro-5-methoxyphenyl)amino]-2-{4-[(dimethylamino)methyl]phenyl}thieno[3,2-b]pyridine-6-carbonitrile;

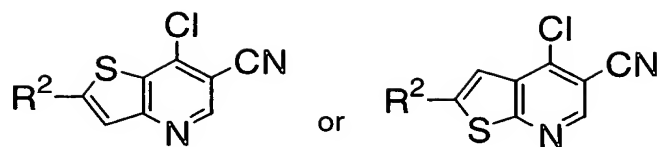
7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-{5-[4-methylpiperazin-1-yl)methyl]pyridin-2-yl}thienol[3,2-b]pyridine-6-carbonite;

- 20 7-[(2,4-dichloro-5-methoxyphenyl)amino]-2-[4-(piperazin-1-ylmethyl)phenyl]thieno[3,2-b]pyridine-6-carbonitrile;

and a pharmaceutically acceptable carrier.

55. A process for preparing a compound of formula (1a) or (1b) as defined in claim 1 or a pharmaceutically acceptable salt thereof, which comprises one of the following:

- 25 a) reacting a compound of formula:



or an S-oxide or S-dioxide thereof; wherein R^2 is as defined in Claim 1 with a compound of formula R^1XH where R^1 and X are as defined in Claim 1 to give a compound of formula I(a) or I(b);

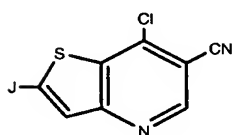
5 or

b.) reacting a compound of formula 1a or 1b or an S-oxide or S-dioxide thereof in which R^2 is a reactive substituent group to give a compound of formula 1a or 1b in which R^2 is a different substituent group as defined in claim 1;

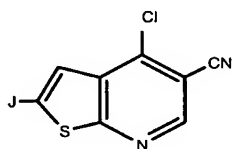
or

10 c.) optionally converting a compound of formula (1a) or (1b) to a pharmaceutically acceptable salt thereof.

56. A compound of Formula (z) or (z')



(z)



(z')

wherein J is Br or I.

15